What is claimed is:

1. A method of burst switching in a network that includes at least one core node and a plurality of edge nodes, comprising the steps of:

generating, by said core node, at least one edge-node-specific burst transfer permit;

distributing, by said core node, said at least one edge-node-specific permit to at least one of said plurality of edge nodes; and

sending, by at least one of said plurality of edge nodes, data bursts to said core node based at least in part on information in said burst-transfer permit.

2. The method of claim 1 wherein said core node and edge nodes are arranged in a composite-star configuration with a second core node, and including the further step of sending, with each core node, burst-transfer permits to said plurality of edge nodes.

3. The method of claim 2 including the further step of specifying, with each of said edge-node-specific burst transfer permits, burst size and destination.

4. The method of claim 3 including the further step of specifying, with said edge-node-specific burst transfer permits, arrival time at said core node.

5. The method of claim 4 including the further step of receiving, with each edge node, permits from each core node.

6. The method of claim 5 including the further step of each edge node sending data bursts to each core node according to a burst size specified by a respective permit.

7. The method of claim 6 including the further step of each of said edge nodes determining the timing of transmitting data bursts to each core node so that each of said data bursts arrives at a corresponding core node at said required arrival time.

8. The method of claim 7 including the further step of an edge node simultaneously transferring data bursts to a plurality of core nodes.

9. The method of claim 8 wherein said network has collocated edge nodes and core nodes, and including the further step of facilitating said timing by substantially equalizing propagation-delays from the edge nodes to the core nodes.

10. The method of claim 8 including the further step of facilitating said timing by time locking each edge node to each core node.

11. The method of claim 1 including the further step of causing said edge-node-specific burst-transfer permits to be conflict-free.

12. Network communication equipment that facilitates burst switching, comprising:

a plurality of edge nodes;

a core node having a plurality of optical switches, each of said optical switches including:

a burst scheduler operative to generate at least one edge-node-specific burst transfer permit;

a transmitter operative to distribute said at least one edge-node-specific permit to a plurality of edge nodes; and

a receiver operative to receive data bursts sent from said edge nodes to said core node,

wherein said data bursts are sent based at least in part on said burst-transfer permit.

13. The equipment of claim 12 including a second core node arranged with said first core node and said edge nodes in a composite-star configuration, and wherein said second core node also includes a burst scheduler such that each of said core nodes is operative to send burst-transfer permits to said plurality of edge nodes.

14. The equipment of claim 13 wherein said edge-node-specific burst transfer permit indicates burst size and destination.

15. The equipment of claim 14 wherein said edge-node-specific burst transfer permit specifies arrival time at said core node.

16. The equipment of claim 15 further including a receiver in each edge node operative to receive permits from a plurality of core nodes.

17. The equipment of claim 16 further including a transmitter in each edge node operative to send data bursts to each of said plurality of core nodes according to burst size specified by a respective permit.

18. The equipment of claim 17 further including a timing controller in at least one output port of each said edge node operative to determine the timing of transmitting data bursts to a plurality of core nodes so that each of said data bursts arrives at a corresponding core node at said specified arrival time.

19. The equipment of claim 18 further including a plurality of transmitters in each edge node operative to simultaneously transfer data bursts to a plurality of core nodes.

20. The equipment of claim 18 wherein said edge nodes and core nodes are collocated, and wherein propagation-delays from the edge nodes to the core nodes are substantially equalized.

21. The equipment of claim 18 wherein each edge node is time locked to at least one optical switch in a core node.

22. The equipment of claim 12 further including a scheduler operative to cause said edge-node-specific burst-transfer permits to be conflict-free.

23. A method of burst switching in a communication network having at least one core node and a plurality of edge nodes, comprising the steps of:

sending, by at least one of the edge nodes, a bitrate allocation request for a node pair, said request being sent to a controller of the core node;

generating, by a controller of the core node, at least one edge-node-specific burst transfer permit corresponding to the bitrate allocation request;

distributing said at least one edge-node-specific burst transfer permit by said controller to at least one of the plurality of edge nodes; and

sending data bursts from at least one of the plurality of edge nodes to said core node based at least in part upon said burst-transfer permit.

24. The method of claim 23 including the further step of updating the bitrate allocation request for said node pair.

25. The method of claim 24 including the further step of specifying, with each said edge-node-specific burst transfer permit, burst size and destination.

26. The method of claim 25 including the further step of specifying, with each said edge-node-specific burst transfer permit, arrival time at said core node.

27. The method of claim 23 wherein said data burst is associated with a burst stream and including the further step of sizing the data burst based at least in part on at least one attribute of the burst stream to which said burst belongs.

28. The method of claim 27 wherein said attribute is a bitrate allocation.

29. The method of claim 27 wherein said attribute is a service class.

30. The method of claim 23 wherein bitrate-allocation requests are associated with a burst stream and including the further step of switching all bursts of a burst stream in the same core node.

31. The method of claim 23 including the further step of time locking each of said plurality of source nodes to said core node.

32. The method of claim 23 including the further step of said core node generating said burst-transfer schedules periodically.

33. The method of claim 25 including the further step of setting a lower bound for said burst size based at least in part on guard-time requirement.

34. The method of claim 25 including the further step of setting an upper bound for said burst size based at least in part on delay-jitter requirements.

35. The method of claim 25 wherein said burst size is limited by a burst-formation delay.

36. A method of determining a size of a data burst comprising steps of:

setting a lower bound and an upper bound for burst size;

associating said data burst with a burst stream;

allocating a bitrate to said burst stream;

selecting an initial burst size of said data burst according to said allocating; and

modifying said initial burst size according to said lower bound and upper bound.

37. The method of claim 36 including the further step of setting said lower bound based at least in part on a minimum burst duration at a nominal bitrate.

38. The method of claim 36 including the further step of setting said upper bound based at least in part on maximum burst duration at a nominal bitrate.

39. The method of claim 36 including the further step of setting said preferred burst size as an integer multiple of a predefined data segment.

40. In an edge node having ingress ports, output ports, a switching fabric, a controller, and a time counter at each of said output ports; a method of data burst formulation comprising steps of:

receiving burst-transfer permits at said controller;
sorting said burst-transfer permits according to destination;
distributing said burst-transfer permits to respective output ports;
receiving data packets of variable sizes at said ingress ports;
segmenting each of said data packets into segments of a predefined size to produce a segmented packet, wherein a last segment that is smaller than said predefined size is null padded;
switching each of said segments to a corresponding output port;
concatenating, at said corresponding output port, segments of a common destination to form data bursts;
modulating an optical carrier by said data bursts to produce a modulated optical carrier; and
transmitting said modulated optical carrier to a core node.

41. The method of claim 40 wherein said concatenating step includes the further step of removing any null-padding from each segmented packet.

42. The method of claim 41 including the further step of extending the size of a data burst by null-padding to be an integer multiple of a prescribed data-size.

43. The method of claim 42 including the further step of transmitting said data burst at a time based at least in part on a reading of said time counter.